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THE "WEEVIL,"

OR

WHEAT MIDGE;

ITS

ORIGIN AND PROPOSED REMEDY,

BY A PRACTICAL FARMER.

MONTREAL:
HENRY ROSE, ST. FRANCOIS XAVIER STREET.
1858.

PRICE, 7½D.

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THE "WEEVIL," &C.

At a time when the farmers of Canada, and of the western continent generally, are suffering to an alarming extent from the ravages of the wheat insect, it cannot be deemed other than an imperative duty to lay such facts before them, as may enable them in some measure to anticipate its attacks, and to devise such measures as may tend to neutralize the evil effects arising from this source of mischief. The importance of this consideration increases, when we reflect that ours is purely an agricultural country, that all business is dependent, more or less, on the success of the agriculturist, and in short, that on the farmer depend the entire hopes and prospects of our community, for the present and future. Our cities readily feel any material fluctuation in the price of Canada's staple product, while such of our country population as may happen to depend on their skill as a source of income, suffer in common with the centres of population.

It is then a question of serious moment, what can be done in order to secure the principal source of our wealth from calamity. There is no one exempt from the responsibility which this question involves. The professional man, the merchant, the mechanic, the laborer, have each and all the deepest, and most direct interest in the solution of the problem, "what can be done to render the position of the farmer more profitable and independent?" It is true, the question is a difficult one, and all the more so, because the agricultural portion of our

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population must be made to ***understand,*** so as to act on the advice tendered. They must be brought thoroughly, at whatever labor, to feel, that the deepest interest is taken in their position, and to see that the remedies suggested have the stamp of reality, and are at least worth trying. As soon as this conviction fastens itself on their minds, so soon will good results attend the labors undertaken on their behalf.

Considering the extent to which the wheat insect has carried its depredations, it is scarcely creditable to Canada, that no *practical farmer* has yet been found able to grapple successfully with the subject.

It is true, that efforts have been made to place before the farmer the precise nature of this insect, and antidotes have been devised, all of which, unfortunately, have failed to produce any valuable result. It is not so much the history of the wheat fly, or midge, that is wanted—neither is it of great importance to the practical farmer, that its various species should be classified and reduced to order, —what is wanted is its constitution, its habits, the different stages through which it passes, its times and seasons, and finally, the proper period to attack it, with the mode by which this can most successfully be accomplished. These we propose to treat plainly and unostentatiously, and avoiding all scientific terms, we shall endeavor to lay before the farmer, the "cause and cure," in the sincere hope that our labors may be crowned with, at least, some degree of success.

We do not here profess to have studied the science of natural history, or at least its Entomological department, in accordance with that classical form which is adhered to by our learned naturalists. Of such studies we certainly highly approve, they at once tend to beautify the mind, and fit it for high and lofty contemplation ; but to a practical man, whose lot it is to gain his bread by the sweat of his brow, so varied and arduous a pursuit is, in most instances out of the question, — nor is it necessary that he should have extended his researches over the wide domain of nature, before he can give to the world the result of his observation, within the narrow circle to which he is more particularly confined; and farther, we are of opinion, that the researches of the naturalist are, for the most part, too general to be throughly practical on any one point, unless, indeed, that one subject has received from him the principal part of his study.

But, far as we are from depreciating the goodness and industrial habits of our farmers, it cannot be denied, even by the writer, who himself has, from his youth, been a practical agriculturalist, that the farmer exercises his higher faculties to an extent by far too limited, feeling, when he has returned from the fatiguing labors of the day, that the world can blame him for nothing; and it seems a matter of regret, that notwithstanding all the myriads of animated beings which crowd his path, he rarely contemplates the end for which they were created, or their use in the economy of nature. This absence of the exercise of thought is deeply to be regretted, and there can be no doubt that, had thinking habits been more generally cultivated, we long ere now should have found men in the ranks of agriculture, equal to the task of banishing for ever the wheat fly from our country, or, at least, of so reducing its numbers, as to render it comparatively harmless. But the man who would undertake this task, must himself not only be intimately acquainted with the insect, and understand its nature and habits, but he must at the same time be also a practical agriculturist, else, very probably, the remedy prescribed by him will be useless, from his want of a knowledge of the routine of the farm, and what is possible and imposible in connection therewith, both as regards physical labor, and the expense attendant on the application of his remedy.

At the present day, there is no expression more frequent among farmers than that which affirms that there was a time in their rememberance when the wheat fly (we do not say the weevil, for it is little known in Canada), was unknown, and certainly the remark is not devoid of truth, — we, with them admit that there was a period, and that not very remote, when this insect, and its ravages on the wheat crops, were utterly unknown on the Western Continent.

But the period to which this remark extends and the present are very different. Since then the wilderness has become a fruitful field—the forest has fallen under the axe of the woodman, and its place is occupied by green waving fields of grass and grain ; and it seems that a more perfect and improved state of country brings with it its attendant evils, like those which usually accompany advanced civilization.

Let us for a moment consider the difference between town and country. As our population gathers to those centres in which are developed lofty mental resources, and while the finer sensibilities of our nature, from the friction of mind on mind, are rendered more exquisite — for we say that the city is the focus in which numerous minds converge, and produce great results — does not the fact of a congregation of human beings, bring with it pale cheeks, consumption, fevers, and all the ills attendant on man? Yet, notwithstanding these results, we do not think of dispersing the population of our cities, in order to effect a cure,* but rather resort to sanitory measures to preserve the general health, and to adopt means comensurate with the evils attendant on a crowded state of society — in short, so far as in our power, to secure in the city by art, that which the country inherits from nature.

Now, is it not true, that there was a time when the spot on which the city now stands, although possessing fewer pretensions, was almost free from every disease under which it now labors, and we are therefore driven to the conclusion, that those diseases, are the price which we pay for the privileges of society, with all its attendant refinements. We here, in like manner remark, that there was, according to the farmer's observation, a time when the country, or district in which he lives, was free from the wheat midge,—on the same principle as we have observed with regard to cities, and their change from a healthy to an unhealthy state, consequent on an accumulation of human beings at one place. The very fact of our country having arrived at a certain stage of improvement in agriculture, accounts for the presence of the farmer's worst enemy. It has been observed, and perhaps justly, that climate is more or less influenced and its harsh features more or less modified or equalized by agriculture. This does not appear to be inadmissable, when we reflect on the mutual relation which subsists between the matter composing our soil, and the rarer and more subtle gases composing its circumambient atmosphere — questions which are beautifully illustrated by agricultural chemistry; and it appears to us evident, that in this state of transition, and at a certain given stage, the mutual action of the earth and atmosphere affords facilities for issuing into existence* new tribes of insects, known perhaps at other parts of the earths surface, but just as new to us, as if the species had never existed. It is thus at a certain stage in the improvement of a country, that such scourges as the weevil, the midge or wheat fly, &c., spring into existence; and it is difficult to understand, how, in accordance with the recognised laws of nature, they can at an earlier or later stage appear. It may tend to strengthen this supposition, if by way of analogy, we consider that every zone on the earths surface gives birth to tribes peculiar to itself, and adapted solely to the soil and climate which they were called into existence to inhabit.

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* The remark as to dispersing the city population is intended to have an analagous reference to the plan proposed by some writers, of discontinuing the growth of wheat, as an effectual means of banishing the wheat destroyer.

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* Let us not be accused of favoring the infidel belief, that organized beings are, or can, be called into existence, by a mere fortuitos combination of circumstances — far from it. The ova, we admit, already exist, but require the favoring influence of warmth, moisture, &c., before development is complete, or before they can manifest their mischievous tendencies.

It is thus we seek to account for the origin of the wheat destroyer, which has intruded itself upon us, and of which a few years ago we possessed no knowledge. Having gone this far, we shall here detail our observations, and the results to which they have led.

It is now some years since the writer commenced those observations and experiments, the result of which he now offers. The observations referred to, were first commenced towards the latter end of the month of June, and revealed thousands of tiny flies infesting the wheat field, and fluttering from stalk to stalk as if intent on a definite object.

In a summer evening nothing can be more beautiful than an attentive observation of these insects, and to any one ignorant of the mischief they are committing, there are few sights more interesting. Like the common butterfly in the cabbage garden, the wheat midge deposits its egg carefully in the shooting wheat, which having done, the parent fly dies, and in the course of ten days or a fortnight, the egg which she has deposited assumes life, becomes a little grub, and in due time feeds voraciously on the filling wheat.

Wheat appears peculiarly intended by nature for the food of this insect, and the period between its deposit and the cutting of the grain, seems also to be the exact time requisite to bring it to maturity; and further, it is almost evident, that were the wheat crop entirely discontinued for one year only, the insect would disappear, as there seems to be no other cereal capable of affording it an existence even for one season. This, however, would be a calamity which the country is ill able to bear, and, consequently, some other remedy must be devised. But to carry out our observations, we selected a sheaf of wheat, and prepared a space somewhat equal in extent to that occupied by the sheaf when growing, and shaking it thoroughly over the smoothed earth, we found the surface *sown* over with the diminitive worm.

We next carefully fenced in the space thus occupied, and from day to day watched the progress of the grub towards its chrysalis state, which it generally attains about the third week after it has dropped to the ground. Numbers, however, are imperfectly sealed up at the end of the twenty-eighth day, but generally after this period, according to *our* observations, the grub may be said to have fairly attained the chrysalis state, and secured itself against the rigors of winter. Early in the summer it breaks its tomb, and flutters about, a fly, to propagate its species anew. By our first year's experiments we were enabled carefully to measure the stages through which the wheat fly passed and the time occupied in each stage. Next year we pursued a further investigation, with the view of confirming former results by a renewal of our experiments.

This time we buried large numbers to the depth of several inches in the earth, and securing the spot from all annoyance, watched the result.

At the proper period, we found that the deep buried grubs had risen to the surface, and mounted as gaily on the wing as if they had never been buried — in fact, they resumed life sooner, and appeared stronger, than those which had remained exposed during the winter. Our observations would thus seem to indicate, the futility of the suggestions of those who would advise the farmer to plough deep, so as to destroy this insect.

We must not here be understood as deprecatng deep ploughing, on the contrary there is nothing in connection with proper rotation more essential to successful farming; what we say is, that deep ploughing is next to useless as a mode of destroying the grub.

Having by the most careful observation ascertained the facts above stated, it was not too much to hope that we had succeeded in divesting the subject of at least a portion of the difficulty surrounding it. We assume, first, that the appearance of the wheat insect, is due to a certain transitive state of the soil, in connection with atmospheric action, as also, that wheat is its peculiar food; secondly, the period at which the fly deposits its eggs; thirdly, the adaptation of the time which wheat takes to ripen, to the wants of the grub — it being matured generally at the period when the grain is fit for cutting; fourthly, (as is generally known) that in a given time it asumes its chrysalis form, in which state it remains secure against the rigors of climate, till the following spring, when with returning heat, a new generation succeeds in the fly form, — and, lastly, that it seems to thrive as well, if not better, when buried in the ground, as when left exposed upon the surface.

It was yet, however, to be ascertained how, when scattered in myriads over the mown fields, the larva could successfully be attacked and destroyed.

Careful observation had revealed to us the different stages through which the insect had passed during this year. It first appeared a fly, which busied itself in depositing its eggs in the wheat, and having fullfiled this end, it died. Those eggs being matured, the young grub appeared in motion simultaneously with the wheat assuming a milky state, but it did not begin to feed until the grain had commenced to harden; it then began its work of destruction, and as we have already said, attained its maturity when the wheat was ready for cradling. At this stage they become less tenacious, fall to the ground in large numbers, and after a time again, in turn, assume the chrysalis state. The idea which now presented itself was, at what stage could the insect be attacked with the best effect? As a fly, no power could arrest its progress, and while inhabiting the ears of wheat, in the larva form, its destruction would be equally impracticable, while as a chrysalis, it was found by repeated experiment bidding defiance to every possible means which might be devised for its destruction. Our experiments, therefore, were negative, but we ascertained the periods at which it could *not* be destroyed. We still resolved to try, and as before, prepared a small plot of ground, equal in size to that formerly chosen, namely, the area on which a sheaf of wheat could be grown, and as usual, taking a sheaf in which the insect abounded, we carefully shook it over the prepared plot in such a manner, as to sow the smoothed surface with the matured grub,—this done, and the place secured from every disturbance, we next divided the ground into two equal portions, applying our remedy to the one half, and allowing the other to remain as in former years, undisturbed.

The application consisted of quick lime, supplied in quantities sufficient to color the ground grey. While performing this operation, we covered up the one half of our plot, so as to keep it free from the effects of the lime, and this completed, we anxiously awaited the result,—furnishing ourselves with every facility for the detection of the most minute change.

This was a most anxious and wearisome task, and all the more so, as we felt that if no remedy could avail, then the observations and experiments of years would only be productive of chagrin and disappointment.

Day after day the grub was watched, minutely examined through a glass, and the comparison between the groups in both sections of our little plot carefully noted, and those alone who, after years of arduous endeavours, have at last obtained the object of their pursuits, can realize our satisfaction, on finding that those insects which had been subjected to the influence of lime had, at the end of a few days, shrivelled up and become almost invisible,—the germ of life being evidently gone—while in that portion of the plot where the insects had been allowed to remain unmolested, they had preserved their plumpness, and gradually began to clothe themselves in a shell, which would soon render them invulnerable. We were so far satisfied, and felt assured that some degree of success had attended our labors. But resolved to test this last experiment still more, we spared no pains in boxing up the plot of ground, so as to prevent every disturbance during the winter, and so soon as the snow disappeared we removed the cover and again resumed our observations. On the half of the plot sown with lime, the lens could not detect any trace of the thousands of beings which we had deposited there in the previous autumn, while in the portion not subjected to this treatment, large numbers of the grub were perfectly visible, safe, and complete in their chrysalis form, leisurely awaiting the season when breaking its prison walls, and ascending on its tiny pinions, it would wage its destructive warfare. The satisfaction which resulted from this farther discovery was of no ordinary kind, and we felt amply repaid for the labor of years which we had devoted to this subject.

The results may be thus stated:— we found that the period from the middle of August till the latter end of September is the time when the wheat grub can be successfully destroyed, by sowing the fields with quick lime. As soon as the wheat is removed from the field, this operation must be performed, and it can be accomplished at comparatively little outlay, either of labor or money. At any other period of the year, the application of lime with the view of distroying this insect will be useless, but at this particular period the grub lies exposed in its naked state, is tender and can be easily acted upon,— when once it has, however, encased itself in its little shell, no power short of burning can affect it.

We therefore, entertain the strongest confidence that no farmer in Canada will shut his eyes to the benefit arising from the simple remedy we have here suggested. Let him rest assured if the instructions we have endeavoured to lay down are strictly adhered to, a great benefit will result.

It is just possible, that the simplicity of the antidote offered may prove a stumbling block — we trust, however, this will not be the case, as what we here give to the farmer is the result of many years careful study and investigation, and it cannot be denied, is less theoretical than practical.

It has been stated, but with what truth we cannot determine, that there exists no ill for which nature has not provided a remedy. When we look at Canada, in connection with the subject on which we now write, we must confess that this conviction is strengthened.

Providence, in every instance, adapts means to ends. Canada is no doubt destined to be one of the greatest agricultural countries in the world; yet the fertility of her soil, and the adaptation of her climate to the growth of wheat, (more particularly Western Canada,) would at first sight seem means without an end, while wheat is only sown to be preyed upon by an insect, over which we apparently have no control. We have with a degree of confidence, resulting from careful enquiry, prescribed quick lime as an effectual agent for subduing the wheat destroyer, when applied to our fields immediately before the insect has assumed its chrysalis state, and, moreover, we are confident in its power and effecacy; and if quick lime be really the remedy destined to counteract the influence of the wheat fly, then nature has not left us unprovided for. The immense strata of Limestone which abound in this section of the world, and which is so easily available, may certainly be distined by nature for various other purposes, but if in it we have the material wherewith a deep rooted plague can be removed, and our agriculture freed from the loss which it now annually sustains, we can only acknowledge the wisdom of nature's plans, and the facilities for comfort which her abundant and varied resources place within the reach of her creatures. Nor is lime a substance prejudicial to the soil — on the contrary, while we apply it for the destruction of an insect, we at the same time apply a valuable manure.

But the grubs which fall from the grain on the wheat field do not include the whole; countless numbers adhere to the grain and straw, and are thus conveyed to the barns. To dispose of these is a less difficult task, although great pains must be taken to destroy even those gathered within so small a compass.

After the wheat is threshed out, few will be found adhering to the straw, which is generally well tossed in being taken from the thrashing machine, and which is highly necessary to be preserved for provender, but the *dust* of the thrashing machine, and of the fanning mill, should be gathered up with the most scruplous care, and either deposited in a convenient place, and well mixed with lime, or burned when that can be effected without danger.

With regard to seed wheat, (to which some of the insect may still adhere,) the heaviest should in every instance be chosen, and even this should be exposed to water,* (although only for a few minutes,) previously to its being sown. While subjected to this process, and the wheat well stirred and allowed to settle a few minutes, the insect will be found floating in large numbers on the surface, like small atoms of dust, and can easily be removed and destroyed, after which the wheat being allowed some time to dry, may be sown.

It cannot be argued, even by the most fastidious, that the plans we have here submitted for the destruction of the wheat midge, are either complicated or expensive; on the contrary, they are such as come within the reach of the poorest of our farming community. We, therefore, trust that every farmer in whose hands this pamphlet may be placed, will first carefully peruse it, and immediately act according to its simple directions—we assign him neither a difficult nor laborious work, nor have we submitted our ideas in language unintelligible to even the most superficial, or ill informed reader. Let the farmers of Canada rest assured that the results now given them in this little treatise, are due to a patient and indefatigable research extending over many years, and if even the smallest amount of good can arise from those labors the writer will not only feel well rewarded, but encouraged farther to devote to the agricultural interest in its varied departments his close and unremitting attention, and from time to time, to give to the world, as the only legacy he can bestow, the results of his experience as a practical farmer.

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* See Professor Hind's valuable Prize Essay on this subject, pp. 66 and 67.

In conclusion, we may be pardoned for departing from our subject so far as to express a hope, that in Canada a new era is beginning to dawn on the agricultural interests of the country, and as the benign influences of education continues to operate upon society, we can with certainty look forward to the happiest results.

Hitherto the farmer has considered himself too much a machine, adapted onlyto physical labor, and although the writer of these pages is well aware how difficult it is for the sons of toil, under the burden and influence of constant exertion, to devote to the mind that care which is so much its due yet the thinking principle only requires exercise, in order gradually to develope itself, and whether at the plough or in the bush, in the wheat field or in the barn yard, under every circumstance, we say, — THINK. Let common sense assert its sway — it is a trust-worthy guide, when well exercised, and a monitor whose instructions are free to every human being.

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